

CO₂ high resolution simulation using WRF-GHG over the Kanto region in Japan

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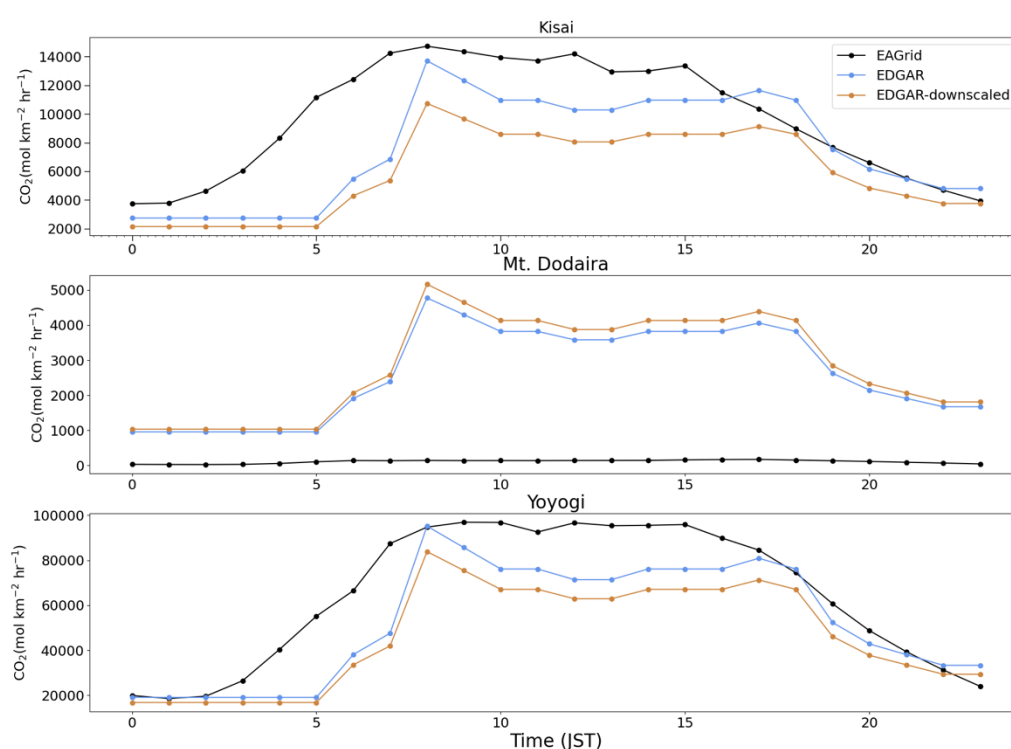


Figure S1: The diurnal variation is shown for different anthropogenic emission inventories for three observation sites in Kanto region, Japan (valid for May 2018 WRF-GHG simulations).

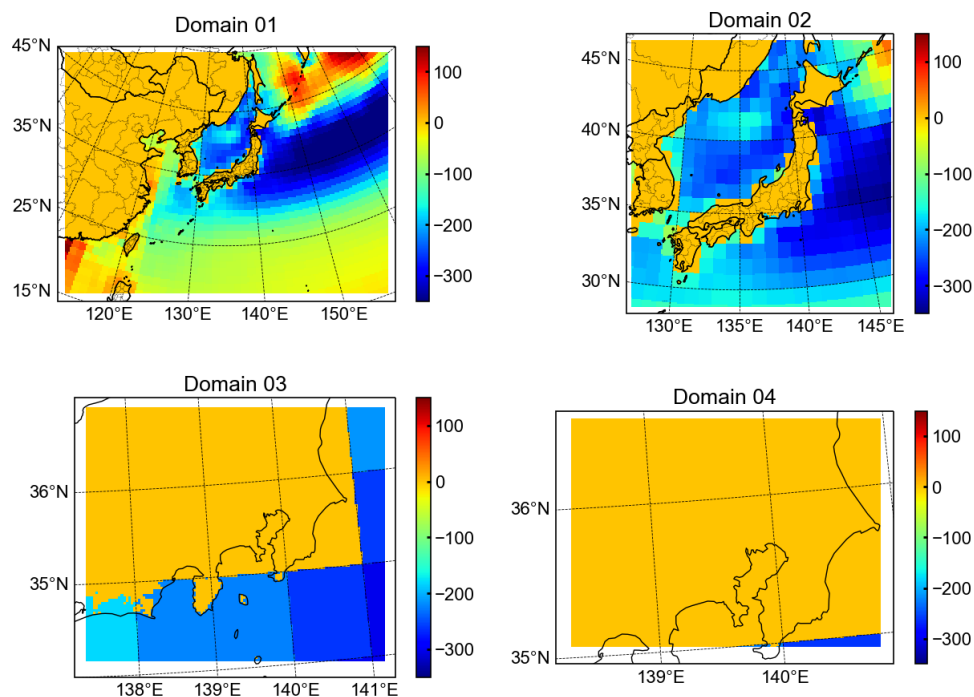


Figure S2: The ocean fluxes ($\text{mol km}^{-2} \text{hr}^{-1}$) used in WRF-GHG to simulate CO_2 is shown over four simulation domains (valid for 01 January 2018).

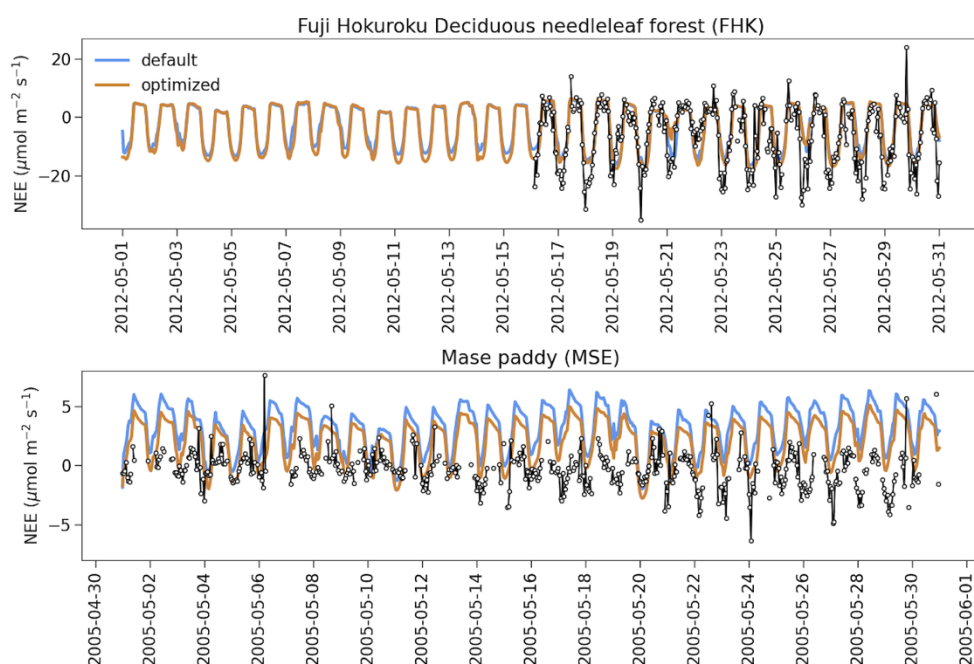


Figure S3: Observed and model calculated NEE (default: blue; optimized: orange) for FHK and MSE sites during May 2019.

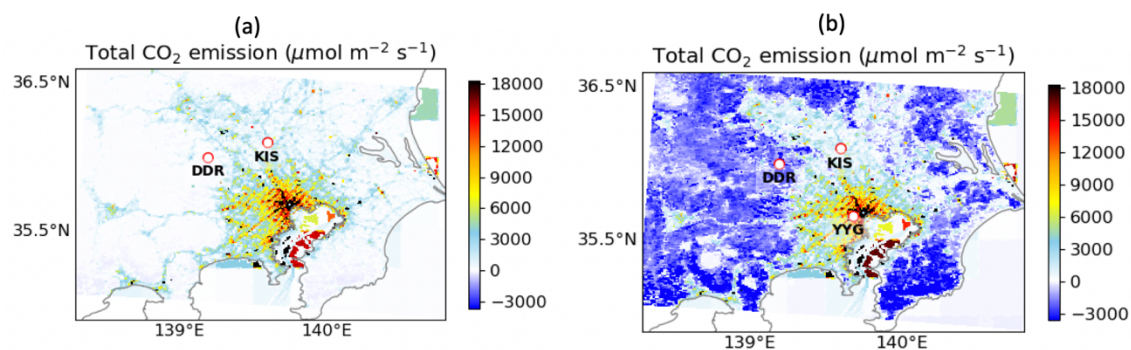


Figure S4: Total CO₂ emissions (anthropogenic; EAgri) are shown for (a) Feb 2018 and (b) May 2018.

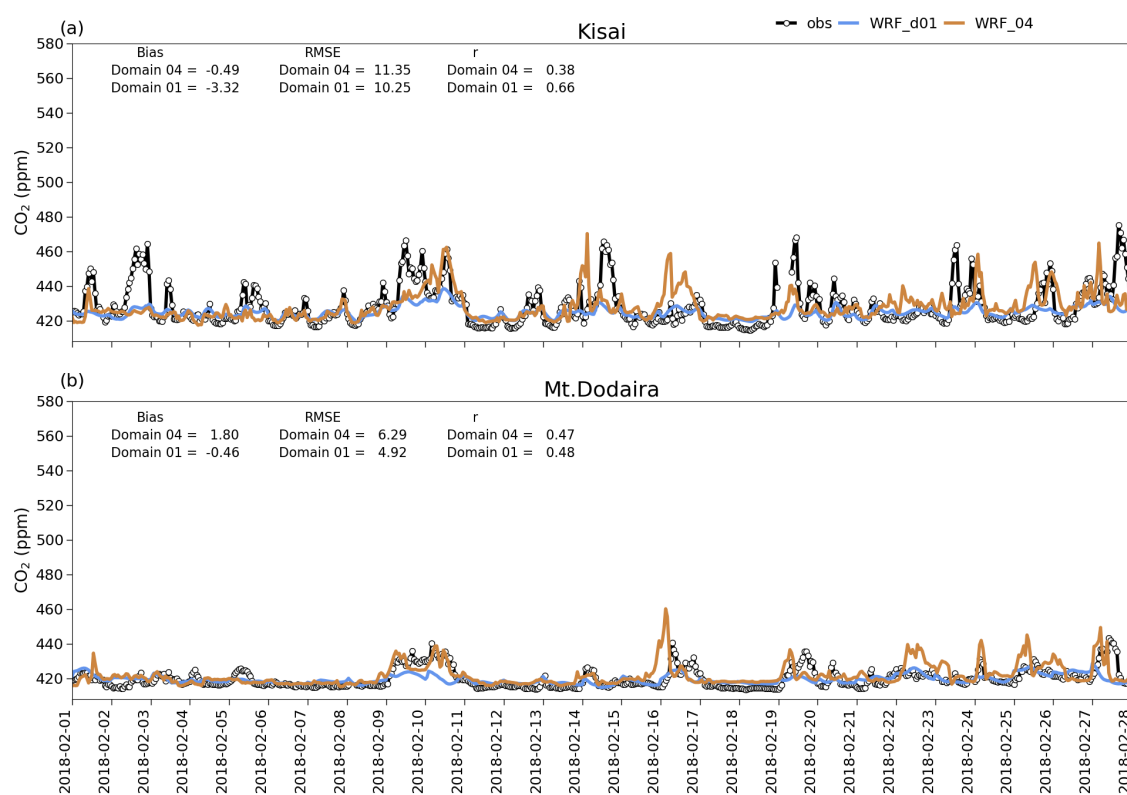


Figure S5: CO₂ concentrations at Kisai and Mt. Dodaira regions during February 2018. The observations (black) shown along with model simulation with EAGrid for domain 01 (27 km) and domain 01 (1 km). Statistics of model observation comparison is given within each panel for both the domains.

28 **Table S1:** Contribution to total CO₂ concentration (ppm) from different tracers during May 2018.

Observation sites	Background (ppm)	Anthropogenic (ppm)	Land (ppm)	Ocean (ppm)
Kisai	417.57	14.13	1.75	-0.27
Dodair	417.17	8.69	-1.42	-0.21
Yoyogi	417.57	27.80	-0.15	-0.30

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